Concept, Importance and Practice of Lateral Tucking in Tympanoplasty

Sohil Vadiya¹

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Abstract The current study aims at observing the technique and results of doing lateral tucking during tympanoplasty surgery. It is intended to provide additional support to the graft and prevent displacement as well. 98 cases included in the study and the graft uptake rate of 97.96% noted. Average pre operative air bone gap (ABG) was 31.12 db and average post operative ABG observed to be 14.01 db. Gain of 17.11 ± 7 db achieved by the procedure. Lateral tucking is a concept that requires to be inculcated in routine tympanoplasty surgeries, especially where canal skin incisions are used. It is easy to practice and the results are good and complications are minimal.

Keywords Tympanoplasty ·
Lateral tucking in myringoplasty ·
Temporalis fascia in tympanoplasty ·
Lateral with anterior tucking in ear surgery

Introduction

Tympanoplasty is one of the most frequently performed surgeries by otolaryngologists these days. The surgical considerations are many and primary aim is to achieve closure of the tympanic membrane perforation and also the closure of air-bone gap (ABG). Many techniques have been described in literature with varied success rates. Roychaudhury [1] has used 3 flap technique with good success rates. Mokhtarinejad et al. [2] have described a technique

of circumferential subannular grafting with good results. The purpose of current study is to describe the technique of ‘lateral tucking’ in tympanoplasty to provide additional support for the temporalis fascia graft and observe the results of this technique.

Materials and Methods

98 ears (90 patients with 8 operated on both sides one by one) included in the study where the standard underlay tympanoplasty performed with the help of temporalis fascia (TF) as the grafting material. Inclusion criteria for the study were a central perforation, dry at the time of surgery, more than 5 mm in at least one dimension (measured by putting graph paper) and absence of cholesteatoma. Cases with marginal perforation or with discharge at the time of surgery or with smaller size were excluded. All cases were carefully assessed clinically and pre operative oto endoscopy and pure tone audiogram (PTA) performed. All cases operated under general anesthesia (GA) with post aural skin incision. Vascular strip incision with anterior tucking (VSAT) method used in all the cases [3]. Abundant gel-foam kept in middle ear. Lateral to manubrium and medial to annulus grafting of TF done [4] with anterior tucking also done in addition. As illustrated in Fig. 1 lateral tucking of the graft material also done. For this, we need to elevate the canal skin for about 3 mm anti-clock wise near the 6 o clock incision in a right ear and clock wise near the 12 o clock incision in a right ear. This will create a pocket between the canal skin and bone of the canal wall throughout the vertical incision. This can easily be achieved by a flag knife or a sickle knife (Fig. 2). The lateral extent of the fascia graft can be tucked here. This should help in two ways. One is that there will not be any

✉ Sohil Vadiya
sohilv81@gmail.com

¹ PramukhSwami Medical College and Shree Krishna Hospital, Karamsad, Gujarat, India

Fig. 1 Illustration to show the concept of lateral tucking

Fig. 2 Lateral tucking being done at 6 o'clock in a left ear

bare bone left between the vertical incisions of canal and the vascular strip when repositioned. Second is that chances of displacement of the graft will be minimum. The patients were advised to maintain regular follow up for at least 4 months. Patients were examined under microscope and suctioning done for the first time after surgery at 3 weeks and one monthly thereafter if there are no complications. PTA done at 4 months post operatively and the results observed.

Results

96 cases had successful graft uptake with complete closure of perforation. Graft uptake rate is 97.96%. Two cases developed small residual perforation which healed with conservative management. Average pre operative ABG was 31.12 db and average post operative ABG observed to be 14.01 db. Gain of 17.11 ± 7 db achieved by the procedure. No worsening of bone conduction threshold, indicative of sensori neural loss observed in any cases. 86 (87.76%) cases had ABG less than or equal to 20 db at

Table 1 Healing time

Healing time	No of cases (%)
< 3 weeks	81 (84.38)
3–4 weeks	9 (9.38)
4–5 weeks	5 (5.21)
> 5 weeks	1 (1.04)
Total	96 (100)

4 months after surgery. 3 (3.06%) cases had occurrence of minor granulations that healed well in a week.

Canal wall sagging was seen in 4 (4.08%) cases and required packing of ear canal for a week. Observations regarding healing time are shown in Table 1. Healing time calculated only for successful surgeries.

Discussion

Many authors described many techniques for better outcome in tympanoplasty. Concerns regarding canal wall related problems have risen these days and one of the important consideration is to provide rapid and smooth recovery to the patients. Gerard et al. [5] have described a technique without canal skin incisions but the technique appears to be difficult and exposure is not as good as with VSAT technique. Shim et al. [6] have described three point fix tympanoplasty with a high degree of graft take and satisfactory hearing results. Gavriel et al. [7] have described inferior flap tympanoplasty for anterior perforations. Peng et al. [8] have described “hammock” tympanoplasty. Faramarzi et al. [9] have described “mucosal pocket” myringoplasty as a modification of underlay technique for anterior or subtotal perforations. Hung et al. [10] have described the importance of anterosuperior anchoring myringoplasty. In all above studies, so much emphasis is made regarding giving maximum support to the graft to minimize displacement or overlap. Fishman et al. [11] have advised zone-based selection of tympanoplasty technique according to location of defect in the tympanic membrane. Hosamani et al. [12] have shown that Type one tympanoplasty with anterior tagging of graft material is a suitable technique for anterior and subtotal perforations. Alzoubi et al. [13] have recommended trans tympanic tympanoplasty for small or medium sized perforations.

The current study is based upon giving lot of consideration on adjusting the fascia graft in the most appropriate way to minimize complications or failures. Lateral tucking is a concept very easy to understand and many of the otologists would be practicing routinely as well. It will also prevent the graft from overlapping on to the canal wall skin at places. It will make sure that the graft is secured well.

Conclusion

Lateral tucking is a concept that requires to be inculcated in routine tympanoplasty surgeries, especially where canal skin incisions are used. It is easy to practice and the results are good and complications are minimal.

Compliance with Ethical Standards

Conflict of interest The authors of this article declare that he/she has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Human and Animal and Rights Animals were not involved in this study.

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